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ABSTRACT

There is a paucity of literature concerned with theoretical and measurement aspects of self-esteem as a teacher, either in Western or non-Western contexts. In this research of professional self-esteem as a teacher, a model was first developed. This model served as a basis for introducing three separate scales to measure student teachers' professional self-perceptions of teaching efficacy, teacher-student relationships, and teaching commitment. These dimensions were designed to be significant for student teachers' professional development in the course of training as well as for evaluating the effectiveness of a teacher education program. A first-order confirmatory factor analysis supported the independence of the dimensions. A second-order analysis supported a hierarchical model when these three dimensions are subsumed into a broader concept of professional self-esteem. It is argued that this model and the instrument developed are salient for future research into professional self-esteem in the arena of teacher education. (Contains 98 references.) (Author/SM)

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Assessing Student Teachers' Professional Self-Esteem: A Hong Kong Construct Validation Study

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Abstract

There is a paucity of literature concerned with theoretical and measurement aspects of self-esteem as a teacher either in western or non-western contexts. In this research of professional self-esteem as a teacher, a model was first developed. This model served as a basis for introducing three separate scales to measure student teachers' professional self-perceptions of teaching efficacy, teacher-pupil relationships and teaching commitment. These dimensions were designed to be significant for student teachers' professional development in the course of training as well as for evaluating the effectiveness of a teacher education programme. A first-order confirmatory factor analysis supported the independence of the dimensions. A second-order analysis supported a hierarchical model when these three dimensions are subsumed into a broader concept of professional self-esteem. It is argued that this model and the instrument developed are salient for future research into professional self-esteem in the arena of teacher education.

Introduction

Teachers' beliefs and thought processes have gained much attention in educational research in recent years (Pajares, 1992). The beliefs a teacher holds about his role and work influence his or her conceptions of children and curriculum, and instructional planning and behaviour (Clark & Peterson, 1986; Nespor, 1987; Pajares, 1992; Richardson, 1996). With respect to teacher preparation, student teachers' beliefs and attitudes affect the way they learn to teach as well as their judgements and behaviour in the classroom (Calderhead & Robson, 1991; Hollingsworth, 1989; Johnson, 1992; Richardson, 1996). Many of these beliefs and attitudes about teaching have been developed before the preservice students join teacher training and they are often than not resistant to change (e.g. Calderhead & Robson, 1991; Goodman, 1988; Lortie, 1975; Weinstein, 1990; Wilson, 1990). It is essential that teacher education play a role in restructuring the preconceptions, of which some actually are misconceptions, for improving professional preparation and practices in teaching.

Terms, such as perspectives, knowledge, attitudes, perceptions, judgements, ideology, conceptions, and preconceptions, are associated with a sense of belief (Pajares, 1992). Hence, the construct of belief is itself broad and encompassing. When we talk about educational beliefs, we often refer them to how a teacher perceives teaching and the role of a teacher. Such beliefs may often be distinguished by their relationship to educational ideas that are external to one's own self. For example, a teacher may agree that activity approach should have a lot of good educational qualities but in fact he/ she sees oneself as more suitable in adopting a traditional approach. On the other hand, there are also other terms associated with belief, such as self-concept, self-esteem, teacher efficacy, and professional self-concept, that can be used to identify the manner a teacher views himself/ herself as a teacher.

Professional self-perceptions, part of the trainees' belief system, can be considered as an indicator for evaluating the quality of teacher education. Any changes in these self-

perceptions resulting from teacher training reflect in part the effectiveness of the institute in engendering a sense of professional confidence, competency, and overall suitability as a teacher in the trainees. Ultimately when the novices leave teacher training, they would be prepared to become more adaptable, if any positive changes in self-perceptions do occur, to challenges of the beginning year of teaching (Moran, 1990; Veenman, 1984). However, a limitation in research in this area is the lack of a conceptual model and the poor quality of relevant instruments. The major objective of this research is to investigate what constitutes the essential schematic components of student teachers' professional self-esteem and to examine the structural relationships among these components. The professional self-esteem represents the manner in which the novices see their own worth and capability in becoming a teacher. To pursue the investigation, efforts were made to formulate models by reference to ideas of teaching as a profession and relevant self-theories. Among these models, two were selected, on the basis of parsimony, for testing their within-construct validity by means of confirmation factor analysis.

Student teachers' personal and professional self-concept

Student teachers' self-concept and professional self-concept have predominantly been measured by semantic differential scales (Coulter, 1974; Coulter & Elsworth, 1976/77; Gregory, 1976; Gregory & Allen, 1978; Walberg, Metzner, Todd & Henry, 1968; Wright & Tuska, 1966) and the Tennessee Self-Concept Scale (Garvey, 1970; Scherer, 1979; Smith & Smith, 1979). In respect of the former measures, a list or clusters of adjectives, which at the same time were applied to measure the self as a person, assessed the professional self-concept. The Tennessee Self-Concept Scale (Fitts, 1965) also was designed to measure self-concept as a person. Current conceptualisations and measurement support the development of self-

concept measures in specific aspects of the self (e.g. Byrne & Shavelson, 1996; Hattie, 1992). Theories and studies in self-concept have shown the significance of situational and salient features of self-concept. Hence, any attempt to measure the professional self-concept should adequately reflect pedagogical experiences of student teachers. Also research in student teacher self-concept should establish, of course, the reliability and validity of their measures.

It appears that only a handful of studies on student teacher self-concept have been published. Coulter (1987) pointed out that this might be due to researchers' commitment to direct observation of teacher behaviour and their emphasis on investigating attitudes and values of student teachers. Some studies have focused on examining the effects of teaching practice on student teachers' self-conceptions. The effects vary with such factors as class levels taught (Wright & Tuska, 1966); different teaching approaches (Walberg, Metzner, Todd & Henry, 1968); length of practice teaching (Covert & Clifton, 1983); the effects of course work (Lindop, 1985); SES of pupils (Smith & Smith, 1979); and teaching practice performance (Doherty, 1980; Garvey, 1970; Scherer, 1979).

A conceptual framework for student teachers' professional self-esteem

The idea of teaching as a profession has been scrutinised by social scientists, educators, and historians (Hoyle & John, 1995; Lieberman, 1956; Perkin, 1985; Sockett, 1985; Stinnett, 1956). Despite variations amongst the views of these authors, there is common agreement that a profession should be characterised by the following criteria: it should be a unique, essential service, involving a systematic body of specialised knowledge and skills, collective autonomy, practitioner autonomy, maintenance of service standards, and training requirements. Teaching, according to these authors, meets only some of these criteria. Nonetheless, any deliberation over teaching as a profession remains solely an academic exercise without a long history of

professionalization within the education sector of different countries, including that of Hong Kong, a struggle for societal recognition and sanction in terms of legitimate authority, status and power, salaries and work conditions, and improvement in service (Hoyle & John, 1995; Larson, 1977; Liberman, 1956; Parkay & Hardcastle, 1990; Perkin, 1985; Smith & Smith, 1994; Stinnett, 1956; Sweeting, 1992).

Apart from the above mentioned criterion approach to studying the nature of the teaching profession, one may be interested in investigating how teachers perceive their profession at work. Often we hear teachers talking about professionalism. But it is perhaps not surprising that there is no commonly construed meaning of the term (Kwan & Chincotta, 1992). Chincotta (1992) attempted to define professionalism in the Hong Kong context as "an ideology, a doctrine or set of beliefs that individuals or groups hold towards the nature of teaching and the role of a teacher" (pp 45). Such beliefs or ideologies may often be distinguished by their relationship to others' educational ideas rather than to one's own. From a psychological perspective, there are terms, such as professional self-concept and teacher self-efficacy, that can be used to identify how an individual views himself or herself as a teacher. Undoubtedly not all professional qualities, such as those discussed above, are relevant to teachers' professional self-perceptions. Moreover as the particular focus of this research was considered in relation to student teachers, the model of professional self-concept developed here should be appropriate for individuals at the stage of teacher education and beginning classroom practice. Such a model may need to be adapted for more experienced teachers.

Figure 1 depicts the conceptual framework for investigating the construction of student teachers' professional self-concept proposed in this research. A hierarchical model is postulated with three distinct first-order dimensions forming a second-order professional self-esteem concept. The professional dimensions, considered being salient for the

conceptualisation of the professional self-concept, comprise teaching efficacy, teacher-pupil relationships and teaching commitment.

Insert Figure 1 about here

Student teachers' professional self-concept, like self-schemata (Markus, 1977; Markus & Sentis, 1982), is constructed from cognitive processing of their experiences of teacher education and teaching. It refers to feelings, thoughts, and attitudes about oneself as a teacher and subsumes both self-description and self-evaluation: a necessary distinction between the two aspects of the self as suggested by self-concept researchers (Bond & Clark, 1999; Burns, 1982; Fleming & Courtney, 1984; Watkins & Dhawan, 1989). Within the context of this research, professional self-esteem rather than professional self-concept is investigated with a view of emphasising the evaluative aspect of the teaching self. It corresponds to student teachers' evaluation about their suitability and worth as a teacher.

As mentioned earlier, professional knowledge is commonly acknowledged as a criterion of teaching as a profession. No matter how one categorises what constitutes professional knowledge for teachers (e.g. Dinham & Stritter, 1986; Hoyle & John, 1995; Reynolds, 1989; Shulman, 1987; Tom & Valli, 1990), it is by and large concerned with learning needs and characteristics of learners, curriculum, teaching methods and strategies, classroom management and discipline, subject content knowledge, school culture, and the relationship of pedagogical knowledge and skills to educational practice. Pedagogical knowledge is, however, only meaningful when it is related to teaching effectiveness. Teacher effectiveness may be determined by such variables as outcomes of teaching, achievement of educational objectives, and evaluation of teaching and learning behaviour (Biddle & Dunkin, 1987; Medley, 1987). The concept of teacher efficacy is commonly found in the literature that

suggests it as an important component of teacher effectiveness (Ashton, 1984; Biddle & Dunkin, 1987; Darling-Hammond & Hudson, 1989; Denham & Michael, 1981; Gibson & Dembo, 1984; McKenna, 1981; Medley, 1987). We consider that teacher efficacy is an essential ingredient of student teachers' professional self-concept. It reflects the novices' personal evaluation on their own sense of competence and effectiveness in performing the role as a teacher.

Conceptualisation of teacher efficacy is derived from the theory of self-efficacy (Gibson & Dembo, 1984). Self-efficacy refers to beliefs about one's capability to perform a course of action in order to attain some intended or desired outcomes (Bandura, 1997). This concept is often considered as analogous to self-concept or self-esteem in that this problem is in some way related to a situation in which self-concept measures on many occasions include components of competence and self-worth (Bandura, 1997; Bong & Clark, 1999). The distinction between self-efficacy and self-concept becomes even more obscure in cases when measures of self-concept concentrate on one's perception of competence. Bandura maintains that self-efficacy and self-esteem conceptually represent two different psychological phenomena. However, there are common features between the two concepts, and they may be related to each other to some extent. Like self-efficacy, information concerning self-worth, besides its global nature of self-conception, can be differentiated in accordance with different domain of activities, such as academic self-esteem, social self-esteem and physical self-esteem, and under different circumstances. As a matter of fact, there have been measures of self-concept or self-esteem that are tied to different areas of functioning (e.g. Byrne & Shavelson, 1996; Marsh, Byrne & Shavelson, 1988). Self-esteem, defined as evaluation of one's own self-worth, should reasonably be regarded as embodying far more than perceptions of one's capability of performing an act or producing a particular outcome. Thus, an individual's consideration on whether he or she is capable of performing a course of action valued by the

individual should bear direct contribution to the individual's confidence, and subsequently to his or her self-esteem. On the other hand, self-efficacy suggests mainly the idea of one's perceived capability or competence, though it may allude to the meaning of self-worth. Compared with self-efficacy, self-concept "is judged to be more inclusive, at least in its theoretical (in contrast to operational) content, because it embraces a broader range of descriptive and evaluative inferences, with ensuing affective reactions" (Bong & Clark, 1999; pp 142). With respect to this study, professional self-esteem, if accepted as it has been defined so far, contains domains of teacher-efficacy that are valued by an individual. On some occasions, however, self-perceived capabilities may not commend themselves to the individual. For example, a teacher who sees himself very capable of fulfilling instructional roles but takes no pride in working in the profession may not consider the efficacious performance being significant to his own aspired state of professional self-esteem.

Studies have showed that social aspects of the self, such as social self-concept (Byrne & Shavelson, 1996; Shavelson, Hubner & Stanton, 1976) and social support/ positive regard (Harter, 1986), constitute a significant dimension of self-concept. Following this rationale, student teachers' belief in teacher-pupil relationships should contribute to the development of professional self-conception. At the beginning stage in teacher education, evidence indicated that student teachers tended to emphasise interpersonal relations (Weinstein, 1990) but laid less stress on academic aspects of classroom teaching for their conceptions of teaching (Book, Byers & Freeman, 1983; Weinstein, 1990). The study of Crane (1974) suggested that there was a significant relationship between student teachers' attitudes towards acceptance of self and acceptance of others and their job satisfaction in teaching.

Professional commitment of a teacher involves a devotion to do the job well and a continuous search for professional development in improving one's knowledge and abilities (Woods, 1986). It denotes responsibility and accountability as regards instructional outcomes

as well as principles and judgements embedded in the instructional process a teacher undertakes (Sockett, 1985). We may argue that student teachers' teaching commitment influences their development of professional self-concept, should it be reflected in their self-respect and recognition for the professional role as well as appreciation from pupils.

Subsequent to the above analyses, we may assume that there should be interactive effects among the three professional self-conceptions (teaching efficacy, teacher-pupil relationships and teaching commitment) in mental processing, and that these three concepts would be integrated into a concept with a broader representation. A term denoting a sense of professional self-esteem is selected to stand for the super-ordinate conception. We take it that such a concept is capable of containing a diversity of professional self-conceptions, and that those sub-ordinate professional self-conceptions identified in this study play a role in developing a kernel sense of professional self-worth.

During the process of teacher education, there are multiple factors that are likely to affect the development of the above mentioned professional dimensions and hence their professional self-concept. As the focus of this study is on developing the PSE model, the sources of influence indicated in Figure 1 are by no means exhaustive in extracting all possible influential sources in this area of research, and they are simply meant to offer a dimensional framework for scrutinising the issue. The factors include early childhood and school experiences, self-identity and personal values, learning from a teacher education programme, field experiences and student teaching, pupil characteristics, ecological environment of the classroom, school characteristics and curriculum, and the influence of professional personnel, such school principles, co-operating teachers, college supervisors, and college/ university supervisors (Avalos, 1991; Eisenhart & Borko, 1991; Goodman, 1988; Hoste, 1982; Hoy & Rees, 1977; Kagan, 1992; Nias, 1986; Powell, 1992; Ross & Smith, 1992). These factors are likely to have effects on the professional self-esteem if they are related to potential experiences

that pertain to such qualities as success/ failure, positive/ negative appraisals, acceptance/ rejection in relationships, and work devotion.

Models of Professional Self-Esteem

As conceptualised in the previous section, three professional dispositions – teacher efficacy, teacher-pupil relationships and teaching commitment - are crucial to the novice teachers' development of professional self-concept. From an initial inspection, we can see that the scales of these three professional dimensions are rather highly correlated, suggesting the existence of strong common covariance for modelling construction (see Table 3). There are a number of models that have been developed concerning the structure of self-concept (Byrne, 1984; Harter, 1986; Hattie, 1992; Shavelson, Hubner & Stanton, 1976). Theorising about models of professional self-esteem can be based on these theoretical perspectives (see Figure 2). In Figure 2a, the aggregation model is represented by the total score of a number of items that measures an overall feeling of professional self-worth and suitability as a teacher, which is referred to as global professional self-esteem (GPS). It was part of the scales developed in the construction of the "My Teaching Self" questionnaire (Yeung, 1997). This model, though simple, fails to take account of possible underlying dimensions and estimation of measurement error of the self-esteem construct (Bagozzi & Heatherton, 1994; Gribbons & Hocevar, 1998). The GPS may assume, however, a broader perspective than the professional self-esteem (PSE) to be discussed below, which is considered only in relation to the three dimensions of teacher efficacy, teacher-pupil relationships, and commitment.

Insert Figure 2 about here

There are two ways in which specific dimensions of general self-concept, such as academic achievement, physical appearances and social relationships, can be structured. In a taxonomic model, self-concept is organised like a series of highly independent factors (facets), such as the constructs of Harter (1982), and Soares and Soares (1983). On the other hand, a hierarchical model suggests that self-concept is structured in such a manner that general self-concept is at the apex of the hierarchy while the more specific self-concepts are at the base, such as the models of Epstein (1973), Shavelson, Hubner and Stanton (1976), and L'Ecuyer (1981). The multidimensional and hierarchical features of self-concept have been supported by studies (e.g. Byrne & Shavelson. 1986, 1987, 1996; Fleming & Courtney, 1984; Marsh, Byrne & Shavelson,1988; Marsh & O'Neill, 1984; Watkins, Fleming & Alfon, 1989).

In Figure 2b, the partially aggregated model consists of the latent construct PSE that represents the covariance of the three professional dimensions, each of which is measured by a total score of their corresponding scale. This is a simple, parsimonious model while at the same time taking measurement error into account. The measurement error, however, confounds with variance unique to the three dimensions (Gribbons & Hocevar, 1998; Rindskopf & Rose, 1988).

With respect to the partial disaggregation model (Figure 2c), the first-order analysis tests if the three latent constructs – Teaching Efficacy (TE), Teacher-Pupil Relationships (TPR) and Teaching Commitment (CT) – are independent of another. Each construct comprises three sub-scales (testlets) formed by aggregating approximately equal number of items from their corresponding scale: TES1 and TES2 consisting of seven items whereas TES3 six items from the Teaching Efficacy Scale; TPRS1 and TPRS2 of four items whereas TPRS3 three items from the Teacher-Pupil Relationships Scale; CTS1, CTS2 and CTS3 four items from the Teaching Commitment Scale. The three indicators per factor would help minimise improper solutions and negative effects on fit indices (Bagozzi & Heatherton, 1994;

Ding, Velicer & Harlow, 1995; Gribbons & Hocevar, 1998), while maintaining its parsimonious status. This model takes into account random measurement error, which also confounds with unique variance attributable to the dimensions.

In Figure 2d, PSE is a second-order factor that explains the covariance of the three latent professional constructs described in Figure 2c. This partial disaggregation model (second-order analysis) partitions the variation of the measured variables (indicators) of the constructs into random measurement error, unique variance attributable to the constructs, and common variance across the constructs (Bagozzi & Heatherton, 1994; Gribbons & Hocevar, 1998; Rindskopf & Rose, 1988).

The structuring of PSE in Figure 2e is similar to that of Figure 2d except that the GPS is also considered as a first order-factor. This arrangement is meant to ensure that an overall feeling of worth is accounted for in the PSE and thus the measurement of the latter can ostensibly be widened. However, in doing so it violates a factoring principle suggesting that GPS should be at least as inclusive as PSE and thus be considered as a second-order factor. This model may be viable in terms of measurement consideration but lacks a reasonably conceptual support. After all, the PSE implicitly contains the meaning of GPS and its measurement capacity can be expanded when one comes up with new measures in addition to the three professional dimensions.

Figure 2f shows a second-order modelling of PSE with the three professional constructs each having individual items from their respective scale as measured variables. This total disaggregation model is far from being parsimonious, especially when it is involved in structural equation modelling with other constructs. It would incur likely high levels of random error and undermine the possibility of model fit (Bagozzi & Heatherton, 1994; Ding, Velicer & Harlow, 1995; Gribbons & Hocevar, 1998).

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Given the strengths and weaknesses of the above models, this study focuses on testing models 2c and 2d only. This does not imply an undervaluing of the significance of the other models but that the two models to be tested possess the advantages of taking into account likely measurement parsimony and construct validity. After all, the second-order partial disaggregation model has a good potentiality for future research, especially on covariance modelling, once it passes the test of validation.

Aims of the study

The aims of this study are:

1. To construct measures that assess the professional dimensions of teaching efficacy, teacher-pupil relationships and teaching commitment;
2. To examine a hierarchical organisation of the three dimensions into a higher-order professional self-perception; and
3. To test the structural independence of student teachers' self-perceptions of three professional dimensions – teaching efficacy, teacher-pupil relations and teaching commitment.

Method

The Sample

The effective sample size of the study consisted of 471 student teachers who enrolled in the first and third year full-time three-year preservice courses at four colleges of education in Hong Kong in the 1994-95 academic year. They occupied about 60% of the total enrolments of the two year-groups. The proportion of the first year to the third year students participating in the test was about 1.5 to 1.0. The ratio of female to male students was about

3.3 to 1. For this study, the first and third year students were combined together in analysis because initial data inspection suggested that the magnitude and structure of causal relationships among the latent variables and indicators when examined separately for the two year-groups closely resembled to one another. The data integration helped reduce the complexity in reporting the findings of this study. The four colleges were responsible for providing a wide range of teacher education courses, which included initial full-time preservice training of non-graduate students, full-time advanced training courses for qualified and experienced teachers, part-time in-service and refresher training courses, and trainer training courses. For the initial preservice training, there were three-year full-time course, two-year full-time course and one-year full-time course. Throughout the entire course of training, the student teachers of these preservice courses were required to undertake learning in four areas: professional studies, elective studies, practical teaching, and general studies. Since 1995, the four colleges were merged together with the Institute of Language Education to become the Hong Kong Institute of Education.

Data collection procedures

Data of this study were collected through the "My Teaching Self" questionnaire, which was originally designed to investigate the effects of teaching practice on the development of general and professional of self-esteem (Yeung 1997). Thus, the four scales discussed in this study – Professional Self-Esteem (PSE), Teaching Efficacy (TES), Teacher-Pupil Relationships (TPRS), Teaching Commitment (CTS) and Global Professional Self-Esteem (GPS) - were only part of the questionnaire. Each item of the scales was to be responded to on a Likert-scale from 1= Strongly disagree to 5= Strongly agree. In order to maintain consistent scoring contributions of items to a scale, the scoring of some items with negative notions was reversed, whereas the scoring of items with positive notions remained as it was originally designed.

The measures

The measured variables (indicators) for the latent constructs TE, TPR and CT were derived from three sub-scales of their respect scale - Teaching Efficacy Scale (TES), Teacher-Pupil Relationships Scale (TPRS) and Teaching Commitment Scale (CTS). Yeung (1997) devised these scales as part of an investigation into the development of student teachers' professional self-esteem. Each sub-scale contained approximately equal number of items, depending on the total number of items each of the total scale was originally made up of (see descriptions of models 2c and 2d in the previous section). The scales were shown to be unidimensional and they demonstrated satisfactory reliability in terms of their respective Cronbach Alpha coefficient and corrected item-total correlations (see Table 2). The descriptions of the scales are as follows.

1. Teaching Efficacy Scale (TES)

   The 20-item TES measures student teachers' belief in their adequacy of teaching skills and knowledge for dealing with classroom learning and of capability of bringing about learning in pupils. TES incorporated both the rationales of the Personal Teaching Efficacy and Teaching Efficacy of Gibson and Dembo's (1984) Teacher Efficacy Scale. Nonetheless, only one item is derived from the Teacher Efficacy Scale subsequent to a series of validation procedures (see Yeung, 1997).

2. Teacher-Pupil Relationships Scale (TPRS)

   The 11-item TPRS assesses student teachers' overall evaluation about the extent to which they believe that they like to be close to pupils and are concerned about pupils' personal problems, and that pupils enjoy their teaching and respect them (see Yeung, 1997).

3. Teaching Commitment Scale (CTS)

This 12-item CTS measures student teachers' sense of concern and responsibility for teaching (see Yeung 1997).

Model specifications

Initially, LISREL estimation followed the specifications for the first order analysis and second-order analysis as shown in Figures 2c and 2d respectively. At this stage, the error residues were assumed to be uncorrelated as we were uncertain about which of the errors would be correlated. The solutions in Tables 5 and 6 were attained subsequent to further freeing the covariance of a number of error residues based on the modification indices of the LISREL programme.

Model evaluation procedures

The original raw data was processed by the PRELIS 2 programme (Jöreskog & Sörbom, 1993a) to produce a covariance matrix (see Table 1) for parameter estimation and model testing by the LISREL 8 programme (Jöreskog & Sörbom, 1993b). The maximum likelihood (ML) and the weighted least squares (WLS) methods were used for the model analysis. Initial inspection of the data suggested that the observed variables were not normally distributed, violating the multivariate normal distribution assumption of the ML method. Subsequent to the normalising transformations performed by the power function of the PRELIS 2 programme, the best p-value for the multivariate skewness and kurtosis distribution was .0009. Hence, the data remained not normally distributed in multivariate distribution, even though the normality problem was much improved. The WLS method, which requires working with an asymptotic covariance matrix, was also adopted for the estimation, as it is asymptotically distribution free and should work efficiently with the moderately non-normal data from a fairly large sample size of this study (Chou & Bentler, 1995; Raykov & Widaman, 1995). The ML method made use of the covariance matrix derived from the normalised data whereas the WLS method from the non-normalised data (see Table 1).

A number of goodness-of-fit indices were selected for model evaluation and they included: chi-square, the comparative fit index (CFI), the non-normed fit index (NNFI), the root mean square error of estimation (RMSEA), the parsimony goodness of fit index (PGFI), the root mean square residue (RMR), and Hoelter's Critical N (CN). The selection was made after consulting the possible differential effects of sample size, estimation methods, and model complexity or parsimony on model evaluation indices (Ding, Velicer & Harlow, 1995; Hu & Bentler, 1995; Raykov & Widaman, 1995). An adequate model fit is indicated when the chi-square becomes sufficiently non-significant, the CFI and NNFI approach the value of 1.0, and the value of Critical N is greater than 300. The PGFI was reported to check the efficiency of estimation, particularly in the case when correlation among some error residues is released in order to ensure model fit (Mulaik et al., 1989; Williams & Holahan, 1994). The RMR indicated the average size of the residues for the discrepancies between the sample covariance matrix and population covariance matrix. An RMSEA less than .05 at a 90 percent of confidence interval is indicative of close fit (Raykov & Widaman, 1995; Rigdon, 1996). It is noteworthy that all parameters to be reported were obtained from the fully standardised solutions of LISREL outputs, i.e. both measured and latent variables were standardised, except standard errors for coefficient estimation.

Results

The first-order confirmation analysis showed that the three constructs Teaching Efficacy (TE), Teacher-Pupil Relationships (TPR), and Teaching Commitment (CT) were relatively independent of another, despite the high correlations amongst them, and that their respective indicator coefficients were fairly strong (see Table 4). The estimation made by the maximum likelihood (ML) and weighted least squares (WLS) methods resembled closely to each other. These factor analysis results were supported by all model fit indices (see Table 6). It took 16 iterations for the ML method to converge the reproduced covariance matrix with the original covariance matrix, whereas 10 iterations for the WLS method. The PGFI was .42 for both methods of estimation.

With respect to the second-order analysis, both methods of estimation suggested that the factor coefficients for the three constructs Teaching Efficacy (TE), Teacher-Pupil Relationships (TPR), and Teaching Commitment (CT) were rather strong (see Table 5). This indicated that the Professional Self-Esteem (PSE) explained a sufficiently large proportion of the common variance across the three lower-order constructs, demonstrating its strong hierarchical relationship with the three constructs. It appeared that the teacher commitment and teacher pupil relationships loaded more highly on the professional self-esteem than the teaching efficacy did. As regards the WLS method, the indicator coefficients remain at a similar level as that of the first-order analysis. In the case of the ML method, the two indicators TES2 and TES3 of the Teacher Efficacy (TE) in this analysis became stronger than their corresponding counterparts in the first-order analysis while the other indicator coefficients were not quite affected by the second-order analysis. The model fit indices supported the hierarchical organisation between the professional self-esteem and the three constructs Teaching Efficacy, Teacher-Pupil Relationships and Teaching (see Table 6). The

ML method performed 211 iterations to arrive at solution convergence while the WLS only 33 iterations. The PGFI remained at .42 for the two methods of estimation as at the first-order analysis.

Discussion

The previous analysis indicates that the hierarchical structure of the professional self-esteem and the taxonomic organisation of the teaching efficacy, teacher-pupil relationships and teaching commitment into individual dimensions are equally feasible. They reflect literally the cognitive processing of the mind. Either of the structural organisations operates in accordance with which level of the concepts that one is processing mentally. According to the results, the professional self-concept, as a sense of self-worth and suitability as a teacher, should be more inclusive than either of the perceptions of teaching efficacy, teacher-pupil relationships, and teaching commitment. Hence, the latter set of perceptions, as supported by the second-order analysis, could be subsumed into the professional self-concept. When these three lower-order concepts are processed separately, they would be identified as having their own conceptual entity in spite of their close relationships (see Tables 4 & 5).

In addition to the above model fit results, it is obvious that the professional self-esteem (PSE) was highly relevant to explicating the meanings of teaching efficacy, teacher-pupil relationships and teaching commitment. This was supported by the fact that its causal relationships with the other three constructs were strong. On the other hand, the three measured variables accompanied with their corresponding latent constructs were found to be reasonably reliable by examining the second-order estimation (see Table 7). These resultant reliability indications were, however, somewhat lower than the reliability of their respective total scale (note the differences in Tables 2 & 7). Moreover, it appears that one of the three indicators of teaching efficacy, teacher-pupil relationships and teaching commitment was

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weaker than the other two. These are interesting phenomena that are worth further investigation in the future. It is hoped that some sort of regularity as to the reliability of sub-scales of a construct can be established.

There were slight differences found in reliability estimation between the ML and WLS methods. These differences were mainly due to their differential estimation in specific residual variance for the professional constructs (see Table 5). Furthermore, two indicator coefficients of the teaching efficacy estimated by the ML method in the first-order analysis were different from their respective counterparts estimated by the same method in the second-order analysis (see Tables 4 & 5). This situation might be caused by the fact that the data for the analyses could not be normalised to the extent that a satisfactory level of multivariate normality was achieved on the one hand and that a negative coefficient of the indicator TES1, identified at initial analysis, was rectified by fixing it with a value based on its standard error on the other. These modelling method effects affected the maximum likelihood estimation (Gribbons & Hocevar, 1998). The weighted least squares (WLS) estimation did not have the modelling problems as it worked with an asymptotic covariance matrix. The sample size of this study should be large enough for the asymptotic distribution free method to cope with problems arising from data non-normality and to support an efficient and stable estimation (Raykov & Widaman, 1995).

It appears that there was little difference in most of the goodness-of-fit indices estimated by the ML and WLS methods, except that the RMSEA and Critical N estimated by the WLS method were at a much higher significance level than their respective value estimated by the ML method. Again, these differences might be due to the above mentioned modelling method problems.

That the research development in student teachers' professional self-concept has been stagnated at least over the last twenty years does not mean the development of the novices'

professional perception is not in the least a concern in teacher training. In light of the significance of the integrative process for self-directed growth of educational thoughts and autonomous instructional abilities (Kirk, 1986; McIntyre, 1993; Zeichner & Liston, 1987), especially during student teaching, the attempt to foster reflection, critical thinking and inquiry in preservice teaching has been a central aim of many teacher education programmes (Calderhead & Gates, 1993). Thus in the process of teacher education, the novices not only learn pedagogical knowledge, but also come to know something about themselves as a teacher and more about themselves as a person. These self-descriptions reflect their educational attitudes and professional dispositions, and thus shape the way they behave as a teacher. As a matter of fact, these core self-beliefs represent the extent to which student teachers integrate learning in teacher education into their self. Hence, the professional self-perceptions are assets not only revealing the effectiveness of a teacher education programme but also the novices' confidence and potential for becoming a teacher.

The professional self-esteem model (PSE) developed in this study suggests that the professional sense of worth takes into account the self-perceived qualities of teaching efficacy, teacher-pupil relationships and teaching commitment. Under this model, the distinction between teachers with a high sense of professional self-esteem and those with a low sense was subject to variations in the perceptions of competence, relationships with pupils, and a sense of responsibility. In a way, the pride of being a teacher is founded on the three qualities within the measurement of the model. No one would doubt that professional self-esteem and its embedded ingredients represent essential qualities of being a teacher. It is not difficult for one to expect a teacher with high professional self-esteem behave far more than what it is supposed to imply – being confident, competent, pedagogical, amiable, friendly, accepting, optimistic, caring, and committed. As a teacher educator, we would be much concerned about how we are able to instil a strong sense of professional self-esteem into our trainees.

Observing what contributes to the development of student teachers' professional self-concept is, however, a rather complicated matter as there are multiple factors that would affect student teachers' pedagogical experiences and professional self-perceptions. As a result of the investigation of this study, the professional self-esteem (PSE) model would allow one to proceed further in observing various factors, including those of teacher training effectiveness, that would account for the development of student teachers' professional self-esteem. It enables the conduction of complicated observations through structural equation modelling in particular. In other words, it is possible, through the covariance analysis, to simultaneously compare and differentiate the relative influence of multiple factors on the development.

The feasible professional self-esteem model tested in this study can be simplified to become a partial aggregation model (see Figure 2b) by combining the sub-scales of each of the first-order factors into their respective total scale. This arrangement is so significant as to maximise the number of variables that would be involved in structural equation modelling. Figure 1 suggests six possible dimensions of student teachers' personal and pedagogical experiences. One may venture to consider investigating some variables within the dimensions as to their multiple causal effects on the development of the trainees' professional self-esteem. This is indeed a very challenging and exciting research endeavour. For example, one may be interested in investigating whether a training programme which intends to improve student teachers' instructional capabilities and to inculcate in them the proper ways of managing and relating to pupils is effective in promoting the development of the teachers' professional self-esteem through practical teaching. The first step one may take is to sort out significant exogenous factors, such as preparation of student teachers in accordance with objectives of a teacher education programme, pupil and school characteristics, guidance and evaluation of supervisors and co-operating teachers, and identify intermediate endogenous variables indicating student teachers' self-experienced performances during practical teaching, such as

instructional effectiveness, class discipline situations, and relationships with school pupils. Then, based on sound theoretical justifications, hypotheses are made as to the likely causal effects of the exogenous factors on the intermediate endogenous variables, from which possible effects are directed onto the professional self-esteem (PSE).

The professional self-esteem (PSE) model is particularly tailored for measuring student teachers' sense of worth and suitability as a teacher. It is based on the assumption that the model would adequately reflect the salient pedagogical experiences of the novices. When the PSE model is applied to ordinary teachers, it will merely reflect anything no more than those measured qualities it contains. It is expected that teachers in general may have their sense of worth as a teacher resulted from broader professional experiences, such as professional status and prestige, and promotion prospects, in addition to the pedagogical experiences.

Working within a peculiar instructional milieu, teachers inevitably practise so much autonomous authority as many a profession proclaims. Student teachers while having their practical teaching, like teachers in general, make independent, appropriate justifications for lesson planning, teaching strategies and approaches, and instructional evaluation on behalf of pupils' learning needs and their teaching role. They are thus entrusted with the responsibility of nurturing pupils' growth and learning. Given this autonomous status, they work, however, within constrains of school curriculum and have to be accountable to quite a number of agents outside the classroom, such as parents, co-operating teachers and college supervisors. On balance, they come to realise that getting into their stride in an autonomous sense requires them to take into account the relationship between their teaching personality and others' expectations. Indeed, being autonomous in the role as a teacher implies trust from oneself and others in fulfilling professional conduct and competency. It involves accountability of oneself, rationality, knowledge, and a sense of obligation to the wishes and interests of others, such as pupils, parents, and school (Bailey, 1980). In other words, instructional autonomy connotes

both competency and commitment. Hence, the professional self-esteem model of this study focuses exclusively on its relationship to teacher efficacy, teacher-pupil relationships and teaching commitment, while leaving the implicit status of instructional autonomy within the model. After all, student teachers may well be aware that they are treated as playing a marginal role in a practising school. Under such a circumstance, they may hardly see instructional autonomy as a significant component of their professional self-conception.

The PSE model has been successfully validated in the context of Hong Kong teacher education. In order to ensure its generality, further investigations are needed to test the within-construct validity of the three independent dimensions and to examine the hierarchical organisation of these dimensions. It is very much hoped that new findings come about that they help generalise the model from teacher education within both Eastern and Western cultures.

Conclusions

The first-order confirmatory factor analysis supported the taxonomic organisation of the three professional self-perceptions – teaching efficacy, teacher-pupil relationships and teacher commitment - into three distinct but correlated components. The second-order analysis suggested that a higher order factor, termed as professional self-esteem, served to explain the covariance of the three professional perceptions. In other words, professional self-esteem is an abstract concept that can be formed by integrating the other three less inclusive professional self-perceptions. This hierarchical organisation, however, can be broadened when some professional self-perceptions are considered to be significant in conceptualising the professional structure. An aggregate measure, devised by Yeung (1997), for assessing an overall sense of professional self-worth and suitability as a teacher, termed as Global Professional Self-Esteem (GPS), should thus be a broader concept than the professional self-

esteem (PSE) developed in this study. The differential inclusiveness in meaning between these two professional concepts can be tested by involving them in structural equation modelling analysis. As shown in the literature review, there is a lack of a reliable and valid measure for evaluating student teachers' professional self-esteem. It seems that the results of this study provide a basis for future research on teacher and student teacher self-esteem in Hong Kong. Further research will be needed to demonstrate the validity of the model and instrument for western and other non-western cultures. However, for the first time such a model and instrument, based on developments in theorising about the self and utilising the latest research methods, is now available for research in this area.

References

Ashton, P.T. (1984). Teacher efficacy: A motivational paradigm for effective teacher education. *Journal of Teacher education, 35(5)*, 28-32.

Avalos, B. (1991). Contexts, training theory, and teaching practice. *Teaching and Teacher Education, 7(2)*, 169-184.

Bagozzi, R.P. & Heatherton, T.F. (1994). A general approach to representing multifaceted personality constructs: Application to state self-esteem. *Structural Equation Modeling, 1(1)*, 35-67.

Bailey, C. (1980). The autonomous teacher. In Huge Sockett. (Ed.). *Accountability in the English Education System.* (Chapter 7; pp 99-111). London: Hodder and Stoughton.

Bandura, A. (1997). *Self-Efficacy: The Exercise of Control.* New York: W.H. Freeman and Company.

Biddle, B.J. & Dunkin, M.J. (1987). Effects of teaching. In Michael J. Dunkin. (Ed.). *The International Encyclopedia of Teaching and Teacher Education.* Oxford: Pergamon Press.

Bong, M. & Clark, R.E. (1999). Comparison between self-concept and self-efficacy in academic motivation research. *Educational Psychologist, 34(3)*, 139-153.

Book, C., Byers, J., & Freeman, D. (1983). Student expectations and teacher education with which we can and cannot live. *Journal of Teacher Education, 34(1)*, 9-13.

Burns, R.B. (1982). *Self-concept Development and Education.* London: Holt, Rinehart and Winston.

Byrne, B.M. (1984). The general/ academic self-concept nomological network: A review of construct validation research. *Review of Educational Research, 54(3)*, 427-456.

Byrne, B.M. & Shavelson, R.J. (1986). On the structure of adolescent self-concept. *Journal of Educational Psychology, 78(6)*, 474-481.

Byrne, B.M. & Shavelson, R.J. (1987). Adolescent self-concept: Test the assumption of equivalent structure across gender. *American Educational Research Journal, 24(3)*, 365-385.

Byrne, B.M. & Shavelson, R.J. (1996). On the structure of social self-concept for pre-, early, and late adolescents: A test of the Shavelson, Hubner and Stanton (1976) model. *Journal of Personality and Social Psychology, 70(3)*, 599-613.

Calderhead, J. & Gates, P. (Eds.). (1993). *Conceptualizing Reflection in Teacher Development.* London: The Falmer Press.

Calderhead, J. & Robson, M. (1991). Images of teaching: Student teachers' earlier conceptions of classroom practice. *Teaching and Teacher Education, 7(1)*, 1-8.

Chincotta, D.M. (1992). The professionalization of teachers: Vagaries and vicissitudes. In Dino M. Chinocotta. (Ed.). *Professionalization and Education*. Education Paper 15. (pp 41-56). Faculty of Education, the University of Hong Kong.

Chou, C.P. & Bentler, P.M. (1995). Estimates and tests in structural equation modeling. In Rick H. Hoyle. (Ed.). *Structural Equation Modeling: Concepts, Issues, and Applications.* (Chapter 3; pp 37-55). Thousand Oaks: SAGE.

Clark, C.M. & Paterson, P.L. (1986). Teachers' thought processes. In Merlin C. Wittrock. (Ed.). *Handbook of Research on Teaching. (Third Edition).* (pp 255-296). New York: Macmillan Publishing Company.

Coulter, F. (1974). The effects of practice teaching on professional self-image. *The Australian Journal of Education, 18(2),* 149-159.

Coulter, F. (1987). Affective characteristics of student teachers. In Michael T. Dunkin. (Ed.). *The International Encyclopedia of Teaching and Teacher Education*. Oxford: Pergamon Press.

Coulter, F. & Elsworth, G.R. (1976/77). Professional self perception and personality characteristics of student teachers. *Educational Research and Perspective, ¾*, 49-61.

Covert, J.R. & Clifton, R.A. (1983). An examination of the effects of extending the practicum on the professional dispositions of student teachers. *The Alberta Journal of Educational Research, 24(4)*, 297-307.

Crane, C. (1974). Attitudes towards acceptance of self and others and adjustment to teaching. *British Journal of Educational Psychology, 44(1)*, 31-36.

Darling-Hammond, L. & Hudson, L. (1988). Evaluating and encouraging teaching effectiveness. *Educational Research Journal, 3*, 1-12.

Denham, C.H. & Michael, J.J. (1981). Teachers' sense of efficacy: An important factor in school improvement. *Elementary School Journal, 86(2)*, 173-184.

Ding, L., Velicer, W.F., & Harlow, L.L. (1995). Effects of estimation of indicators per factor, and improper solutions on structural equation modeling fit indices. *Structural Equation Modeling, 2(2)*, 119-144.

Dinham, S.M. & Stritter, F.T. (1986). Research on professional education. In Merlin C. Wittock. (Ed.). *Handbook of Research on Teaching. (Third Edition).* New York: Macmillan Publishing Company.

Doherty, J. (1980). An exploratory investigation into the relationship between self-esteem and teaching performance in a group of student teachers. *Educational Review, 32(1),* 21-35.

Eisenhart, M.A. & Borko, H. (1991). In search of an interdisciplinary collaborative design for teacher education. *Teaching and Teacher Education, 7(2)*, 137-157.

Epstein, S. (1973). The self-concept revisited: Or a theory of a theory. *American Psychologist, 28(5)*, 404-416.

Fleming, J.S. & Courtney, B.E. (1984). The dimensionality of self-esteem: II. Hierarchical Facet Model for revised measurement scales. *Journal of Personality and Social Psychology, 46(2)*, 404-421.

Garvey, R. (1970). Self-concept and success in student teaching. *Journal of Teacher Education, 21(3)*, 357-61.

Gibson, S. & Dembo, M.H. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology, 76(4)*, 569-582.

Goodman, J. (1988). Constructing a practical philosophy of teaching: A study of preservice teachers' professional perspectives. *Teaching and Teacher Education, 4(2)*, 121-137.

Gregory, A. (1976). *The effects of student teaching on the professional self-concept of student teachers: A study of student teachers in the professional development program, Simon Fraser University*. Unpublished Ph. D. thesis, Simon Fraser University.

Gregory, A. and Allen, D.I. (1978). Some effects of the practicum on the professional self-concept of student teachers. *Canadian Journal of Education, 3(2)*, 53-65.

Gribbons, B.C. & Hocevar, D. (1998). Levels of aggregation in higher level confirmatory factor analysis: Application for academic self-concept. *Structural Equation Modeling, 5(4)*, 377-390.

Harter, S. (1982). The perceived competence scale for children. *Child Development, 53*, 87-97.

Harter, S. (1986). Processes underlying the construction, maintenance and enhancement of the self-concept in children. In Jerry Suls and Anthony G. Greenwald. (Eds.). *Psychological Perspectives on the Self. (Volume 3)*. (pp 137-181). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Hattie, J. (1992). *Self-Concept*. Hillsdale, New Jersey: Lawrence Erlbaum Associates, Publishers.

Hollingsworth, S. (1989). Prior beliefs and cognitive change in learning to teach. *American Educational Research Journal, 26(2)*, 160-189.

Hoste, R. (1982). Sources of influence on teaching practice in the evaluation of courses in teacher education. *Journal of Education for Teaching, 8(3)*, 252-261.

Hoy, W.K. & Rees, R. (1977). The bureaucratic socialization of student teachers. *Journal of Teacher Education, 28(1)*, 23-26.

Hoyle, E. & John, P. (1995). *Professional Knowledge and Professional Practice.* London: Cassell.

Hu, L.T. & Bentler, P.M. (1995). Evaluating model fit. In Rick H.Hoyle. (Ed.). *Structural Equation Modeling: Concepts, Issues, and Applications.* (Chapter 5; pp 76-99). Thousand Oaks: SAGE.

Johnston, S. (1992). Images: A way of understanding the practical knowledge of student teachers. *Teaching and Teacher Education, 8(2)*, 123-136.

Jöreskog, K.G. & Sörbom, D. (1993a). *PRELIS 2 User's Guide.* New Jersey: Scientific Software International.

Jöreskog, K.G. & Sörbom, D. (1993b). *LISREL 8 User's Guide.* New Jersey: Scientific Software International.

Kagan, D.M. (1992). Professional growth among preservice and beginning teachers. *Review of Educational Research, 62(2)*, 129-169.

Kirk, D. (1986). Beyond the limits of theoretical discourse in teacher education: Towards a critical pedagogy. *Teaching and Teacher Education, 2(2)*, 155-167.

Kwan, T.Y.L. & Chincotta, D.M. (1992). Perceptions of professionalism. In Dino M. Chinocotta. (Ed.). *Professionalization and Education.* Education Paper 15. (pp 41-56). Faculty of Education, the University of Hong Kong.

L'Ecuyer, R. (1992). An experiential-developmental framework and methodology to study the transformations of the self-concept from infancy to old age. In Thomas M. Brinthaupt and Richard P. Lipka. (Eds). *The Self: Definitional and Methodological Issues.* (pp 96-134). Albany: Sate University of New York Press.

Larson, M.S. (1977). *The Rise of Professionalism: A Sociological Analysis.* Berkeley: University of California Press.

Lieberman, M. (1956). *Education As A Profession.* Englewood Cliffs, New Jersey: Prentice-Hall.

Lindop, C. (1985). Evaluating effectiveness in teacher education. *Journal of Education for Teaching, 11(2)*, 165-176.

Lortie, D.C. (1975). *School teacher: A sociological study.* Chicago: University of Chicago Press.

Markus, H. (1977). Self-schema and processing information about the self. *Journal of Personality and Social Psychology, 35(2)*, 63-78.

Markus, H. & Sentis, K. (1982). The self in social information processing. In Jerry Suls. (Ed.). *Psychological Perspectives on the Self. (Volume 1).* (pp 41-70). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Marsh, H.W., Byrne, B.M., & Shavelson, R. (1988). A multifaceted academic self-concept: Its hierarchical structure and its relation to academic achievement. *Journal of Educational Psychology, 80(3)*, 366-380.

Marsh, H.W. & O'Neill, R. (1984). Self Description Questionnaire III: The construct validity of multidimensional self-concept ratings by late adolescents. *Journal of Educational Measurement, 21(2)*, 153-174.

McIntyre, D. (1993). Theory, theorizing and reflection in initial teacher education. In James Calderhead and Peter Gates. (Eds.). *Conceptualizing Reflection in Teacher Development*. (pp 39-52). London: The Falmer Press.

McKenna, B.H. (1981). Context/ environment effects in teacher evaluation. In Jason Millman. (Ed.). *Handbook of Teacher Evaluation*. London: Sage Publications.

Medley, D.M. (1987). Criteria for teaching. In Michael J. Dunkin. (Ed.). *The International Encyclopedia of Teaching and Teacher Education*. Oxford: Pergamon Press.

Moran, S.W. (1990). Schools and the beginning teacher. *Phi Delta Kappan, 72(2)*, 210-213.

Mulaik, S.A., James, L.R., Alstine, J.V., Bennett, N., Lind, S., & Stilwell, C.D. (1989). Evaluation of goodness-of-fit indices of structural equation models. *Psychological Bulletin, 105(3)*, 430-445.

Nespor, J. (1987). The role of beliefs in the practice of teaching. *Journal of Curriculum Studies, 19(4)*, 317-328.

Nias, J. (1986). *Teacher Socialisation: The individual in the system.* Victoria: Deakin University.

Pajares, M.F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research, 62(3)*, 307-332.

Parkay, F.W. & Hardcastle, B. (1990). *Becoming a Teacher: Accepting the Challenge of a Profession.* Boston: Allyn and Bacon.

Perkin, H. (1985). The teaching profession and the game of life. In Peter Gordon. (Ed.). *Is Teaching a Profession? (Second Edition).* (pp 12-25). London: Institute of Education, University of London.

Powell, R.R. (1992). The influence of prior experiences on pedagogical constructs of traditional and nontraditional preservice teachers. *Teaching and Teacher Education, 8(3)*, 225-238.

Raykov, T. & Widaman, K.F. (1995). Issues in applied structural equation modeling research. *Structural Equation Modeling, 2(4)*, 289-318.

Reynolds, M.C. (Ed.). (1989). *Knowledge Base for the Beginning Teachers.* New York: Pergamon.

Richardson, V. (1996). The role of attitudes and beliefs in learning to teach. In John Sikula. (Ed.). *Handbook of Research on Teacher Education. (Seond Edition).* (pp 102-119). New York: Macmillan LIBRARY Reference.

Rigdon, E.E. (1996). CFI versus RMSEA: A comparison of two fit indexes for structural equation modeling. *Structural Equation Modeling, 3(4),* 369-379.

Rindskopf, D. & Rose, T. (1988). Some theory and applications of confirmatory second-order factor analysis. *Multivariate Behavior Research, 23,* 51-67.

Ross, D.D. & Smith, W. (1992). Understanding preservice teachers' perspectives on diversity. *Journal of Teacher Education, 43(2),* 94-103.

Scherer, C. (1979). Effects of early field experience on student teachers' self-concepts and performance. *Journal of Experimental Education, 47(3),* 208-213.

Shavelson, R.J., Hubner, J.J., & Stanton, G.C. (1976). Self-concept: Validation of construct interpretations. *Review of Educational Research, 46(3),* 407-441.

Shulman, L.S. (1987). Knowledge and teaching: Foundations of the New Reform. *Harvard Educational Review, 57,* 1-22.

Smith, J.K. & Smith, L.G. (1994). *Education Today: The Foundations of A Profession.* New York: St. Martin's Press.

Smith, S.D. & Smith, W.D. (1979). Teaching the poor: Its effects on student teachers' self-concept. *Journal of Teacher education, 30(4),* 45-49.

Soares, L.M. & Soares, A.T. (1983). *Components of students' self-related cognitions.* ERIC Document ED228317

Sockett, H. (1985). Towards a professional code in teaching. In Peter Gordon. (Ed.). *Is Teaching a Profession? (Second Edition).* (pp 26-43). London: Institute of Education, University of London.

Stinnett, T.M. (1956). *Professional Problems of Teachers. (Third Edition).* New York: The Macmillan Company.

Sweeting, A. (1992). Historical perspectives: The long march towards teacher professionalism in Hong Kong. . In Dino M. Chinocotta. (Ed.). *Professionalization and Education.* Education Paper 15. (pp 1-40). Faculty of Education, the University of Hong Kong.

Tom, A.R. & Valli, L. (1990). Professional knowledge for teachers. In W. Robert Houston, Martin Haberman, and John Sikula. (Eds.). *Handbook of Research on Teacher Education.* (pp 373-392). New York: Mcmillan Publishing Company.

Veenman, S. (1984). Perceived problems of beginning teachers. *Review of Educational Research, 54(2),* 143-178.

Walberg, H.J., Metzer, S., Todd, R.M., & Henry, P.M. (1968). Effects of tutoring and practice teaching on self-concept and attitudes in education students. *The Journal of Teacher Education, 19(3),* 283-291.

Watkins, D. & Dhawan, N. (1989). Do we need to distinguish the constructs of self-concept and self-esteem. *Journal of Social Behaviour and Personality, 4(5),* 555-562.

Watkins, D., Fleming, J.S., & Alfon, M.C.A. (1989). A test of Shavelson's hierarchical multifaceted self-concept model in a Filipino College sample. *International Journal of Psychology, 24,* 401-410.

Weinstein, C.S. (1990). Prospective elementary teachers' beliefs about teaching: Implications for teacher education. *Teaching and Teacher Education, 6(3),* 279-290.

Wilson, S.M. (1990). The secret garden of teacher education. *Phi Delta Kappan, 72(3),* 204-209.

Williams, L.J. & Holaham, P.J. (1994). Parsimony-based fit indices for multiple-indicator models: Do they work? *Structural Equation Modeling, 1(2),* 161-189.

Woods, P. (1986). Strategies, commitment and identity: Making and breaking the teacher role. In Jennifer Nias. *Teacher socialisation: The individual in the system.* Victoria: Deakin University.

Wright, B.D. & Tuska, S. (1966). *Student and first year teachers' attitudes toward self and others.* Cooperative Research Project No. 1503, Office of Education, U.S. Department of Health Education and Welfare, University of Chicago, Illinois.

Yeung, K.W. (1997). *The impact of teaching practice on general and professional self-perceptions: An investigation of Hong Kong student teachers.* Unpublished Ph. D. thesis. The University of Hong Kong, Hong Kong.

Zeichner, K.M. & Liston, D.P. (1987). Teaching student teachers to reflect. *Harvard Educational Review, 57(1),* 23-48.

Figure 1 A conceptual framework of student teacher professional self-concept

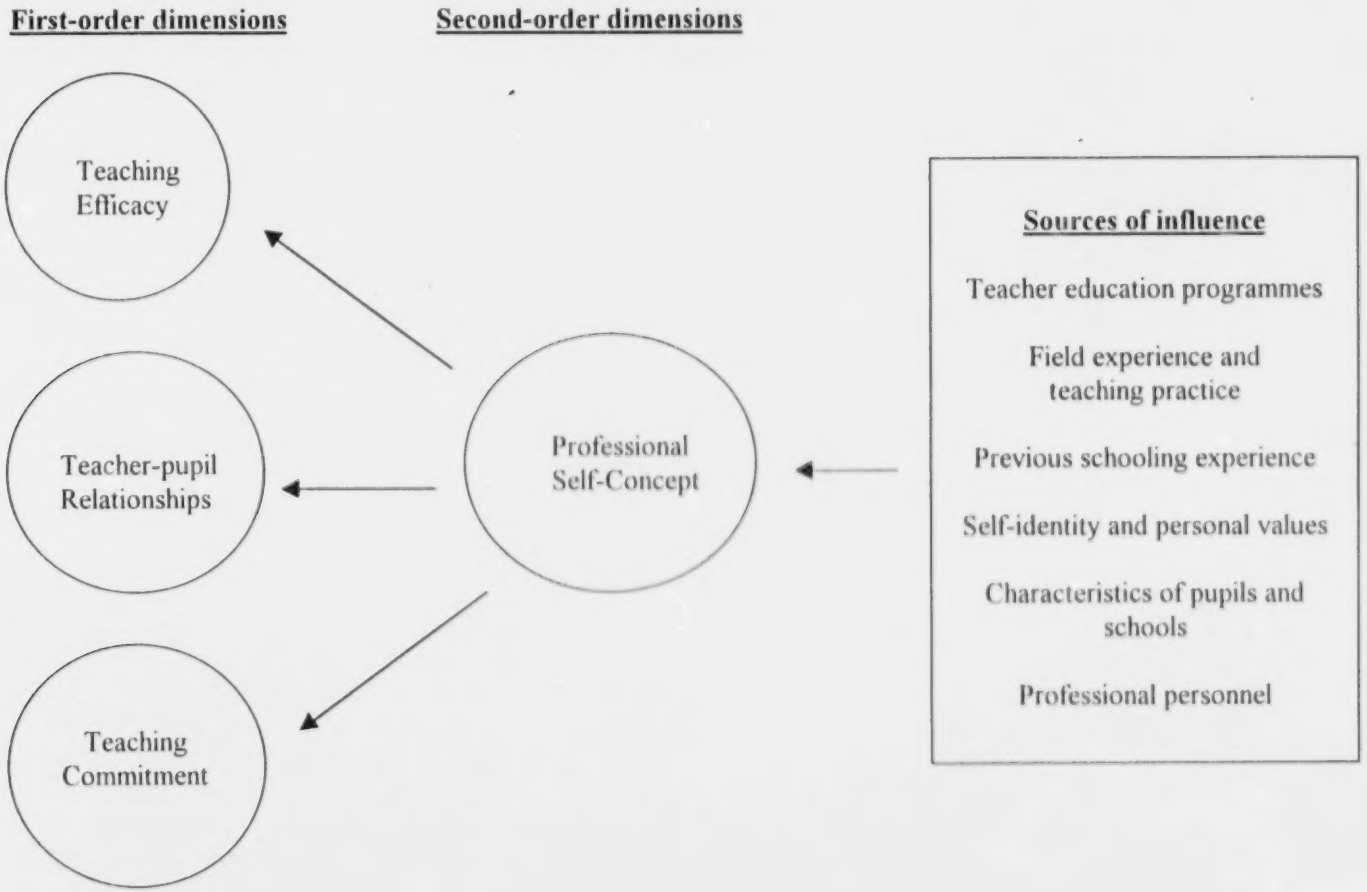
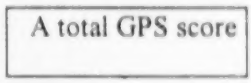
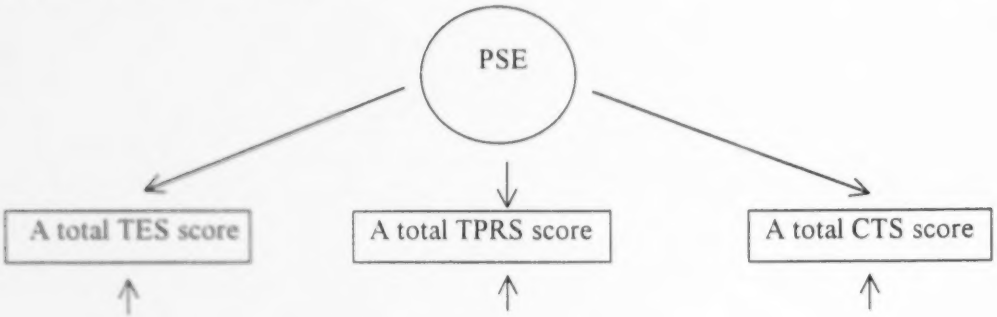


Figure 2 Possible models of professional self-esteem (PSE)

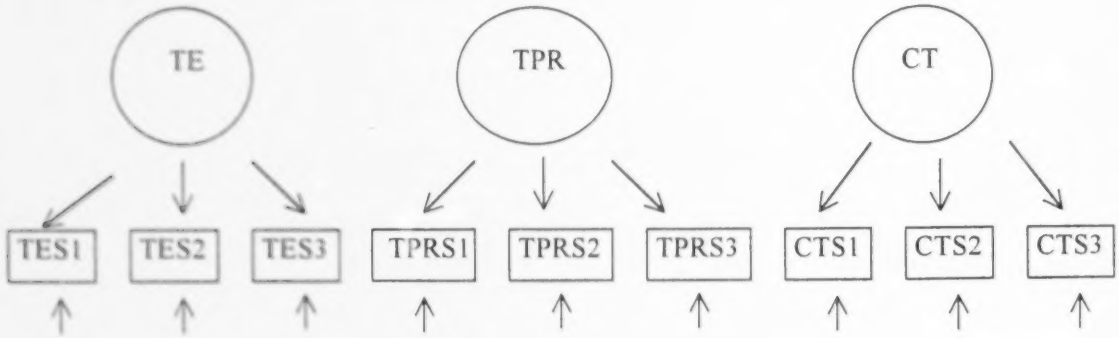
2a Aggregation model (A total scale)



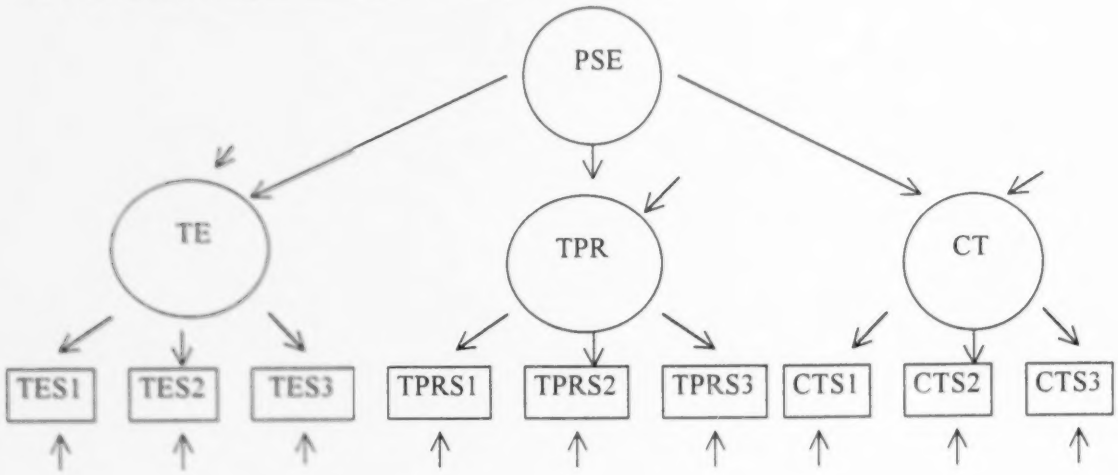
2b Partial aggregation model



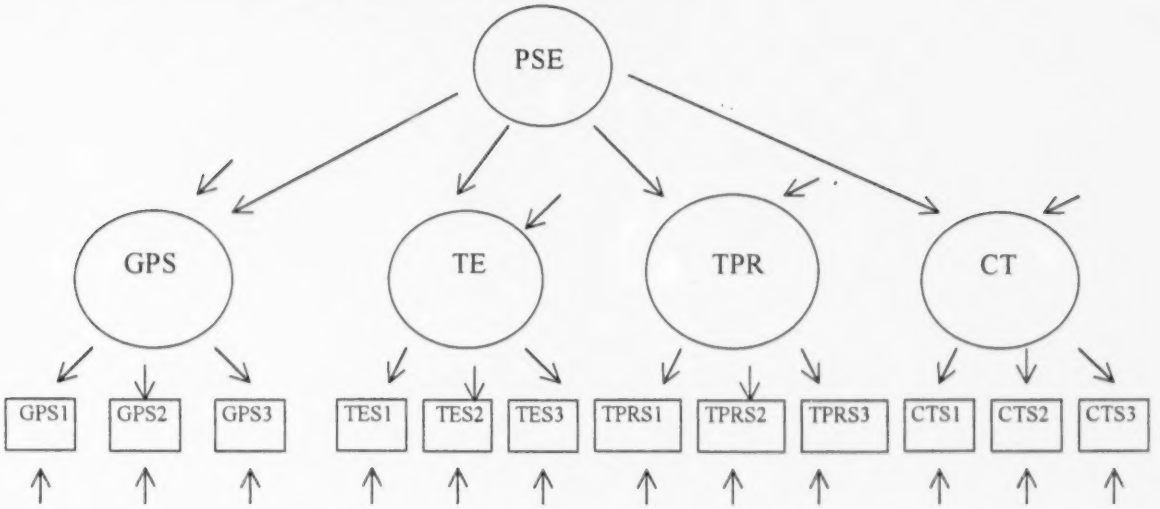
2c Partial disaggregation model (First-order analysis)



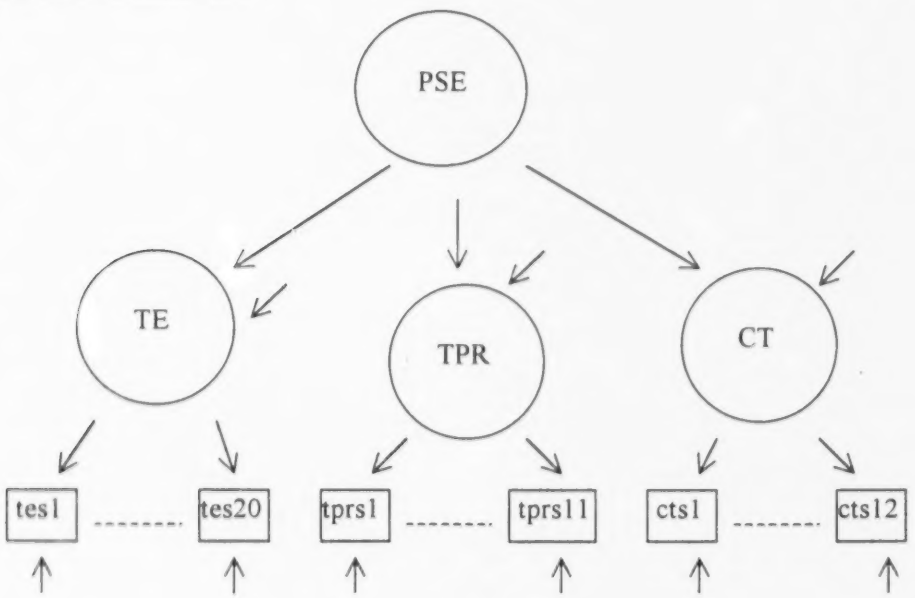
2d Partial disaggregation model (Second-order analysis)



2e Partial disaggregation model (Second-order analysis)



2f Disaggregation model



keys:

A measured variable

A latent variable

Unique variance

TE= Teaching Efficacy construct
TPR= Teacher-Pupil Relationships construct
CT= Teaching Commitment construct
GPS= Global Professional Self-Esteem construct
PSE= Professional Self-Esteem construct
TES= Teaching Efficacy sub-scale
TPRS= Teacher-Pupil Relationships sub-scale
CTS= Teaching Commitment sub-scale
TES1 to TES3, TPRS1 to TPRS3, and CTS1 to CTS3 are testlets or sub-scales.
tes1 to tes20, tprs1 to tprs11, and cts1 to cts12 are individual item measures.

Table 1 Covariance matrices for confirmatory factor analysis of Professional Self-Esteem

	TES1	TES2	TES3	TPRS1	TPRS2	TPRS3	CTS1	CTS2	CTS3
TES1	8.86 537.90	6.78	6.33	3.80	3.05	2.06	2.96	2.83	2.64
TES2	53.16	10.43 10.43	6.51	3.95	2.31	1.66	2.39	2.45	2.16
TES3	353.25	46.70	6.82 348.23	3.06	2.17	1.55	2.30	2.29	1.97
TPRS1	29.76	3.96	21.89	3.79 3.79	1.92	1.42	1.76	1.56	1.50
TPRS2	793.81	78.67	529.09	4.07	3.51 3902.00	1.94	2.22	1.97	2.00
TPRS3	974.08	105.11	688.67	7.79	3877.06	2.03 7613.08	1.51	1.42	1.42
CTS1	778.65	81.98	561.75	9.13	2402.10	2964.90	3.13 3522.40	1.98	1.75
CTS2	22.25	2.46	16.57	1.57	66.11	87.78	67.06	2.77 2.78	1.75
CTS3	20.79	2.17	14.32	1.50	66.87	87.82	58.76	1.75	3.34 3.35

1. The lower triangular half of the above rectangular matrix represented the covariance matrix that was derived from normalised direct measures and it formed the basis for the maximum likelihood estimation. On the other hand, the upper triangular covariance matrix was derived from the original raw data and it, together with its corresponding asymptotic covariance matrix, formed the basis for the weighted least squares estimation.
2. TES= Teaching Efficacy; TPRS= Teacher-Pupil Relationships; CTS= Teaching Commitment
3. TES1 and TES2, each of which consisted of 7 items whereas TES3 6 items from the original Teaching Efficacy Scale.
4. TPRS1 and TPRS2, each of which consisted of 4 items whereas TPRS3 3 items from the original Teacher-Pupil Relationships Scale.
5. CTS1, CTS2 and CTS3, each of which was a combination of 4 items from the original Teaching Commitment Scale.

Table 2 Within-construct validity of the scales – Teaching Efficacy, Teacher-Pupil Relationships, Teaching Commitment and Global Professional Self-Esteem

Validation results	Teaching Efficacy Scale (TES)	Teacher-Pupil Relationships Scale (TPRS)	Teaching Commitment Scale (CTS)	Global Professional Self-Esteem Scale (GPS)
Alpha reliability coefficients	.91	.86	.83	.89
Corrected item-total correlations	.41-.65	.42-.66	.35-.60	.52-.77
Lambda coefficients within an independent, unidimensional scale validated by confirmatory factor analysis	.48-.75 Average loading = .62	.52-.89 Average loading = .62	.39-.76 Average loading = .62	.30-.91 Average loading = .69

1. The above within-construct validity results were also obtained from the sample of this study.

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Table 3 Product-moment correlations among the scales – Teaching Efficacy, Teacher-Pupil Relationships, Teaching Commitment and Global Professional Self-Esteem

Total aggregation scales	Teaching Efficacy Scale (TES)	Teacher-Pupil Relationships Scale (TPRS)	Teaching Commitment Scale (CTS)	Global Professional Self-Esteem Scale (GPS)
Teaching Efficacy Scale	1.00			
Teacher-Pupil Relationships Scale	.65*	1.00		
Teaching Commitment Scale	.60*	.76*	1.00	
Global Professional Self-Esteem Scale	.63*	.70*	.67*	1.00

1. The above product-moment correlations were also obtained from the sample of this study.
2. * $p < .01$

Table 4 First-order confirmatory factor analysis of Teaching Efficacy, Teacher-Pupil Relationships, and Teaching Commitment (Completely standardised solutions)

The measurement model	Maximum likelihood estimation Latent constructs				Weighted least squares estimation Latent constructs			
	Teaching Efficacy TE	Teacher-Pupil Relationships TPR	Teaching Commitment CT	Errors	Teaching Efficacy TE	Teacher-Pupil Relationships TPR	Teaching Commitment CT	Errors
Direct measures of measurement model								
TES1	.96(.88)			.15	.95(.14)			.10
TES2	.73(.16)			.42	.75(.15)			.44
TES3	.85(.74)			.25	.87(.13)			.24
TPRS1		.63(.08)		.67		.65(.08)		.58
TPRS2		.87(.07)		.35		.87(.10)		.24
TPRS3		.81(3.47)		.45		.81(.08)		.34
CTS1			.80(2.36)	.40			.81(.09)	.34
CTS2			.82(.07)	.30			.83(.07)	.31
CTS3			.71(.08)	.54			.72(.09)	.49
Correlations among latent constructs								
TE	1.00				1.00			
TPR	.65	1.00			.67	1.00		
CT	.72	.92	1.00		.73	.92	1.00	

1. All standard errors in parentheses were based on initial unit measure.
2. The maximum likelihood method was working with a normalised covariance matrix, whereas the weighted least square method with a non-normalised matrix.

Table 5 Second-order confirmatory factor analysis of Professional Self-Esteem (Completely standardised solutions)

The second-order model	Maximum likelihood estimation Endogenous latent variables Professional Self-Esteem PSE	Teaching Efficacy TE	Teacher-Pupil Relationships TPR	Teaching Commitment CT	Errors	Weighted least squares estimation Endogenous latent variables Professional Self-Esteem PSE	Teaching Efficacy TE	Teacher-Pupil Relationships TPR	Teaching Commitment CT	Errors
Structural model										
PSE	-	.67(.77)	.90(3.58)	1.00(2.36)		-	.73(.14)	.92(.08)	1.00(.01)	
Specific residues		.55	.19	.02			.47	.14	.05	
Direct measures of measurement model										
TES1	-	.97*			.06	-	.95(.06)			.10
TES2	-	.81(.01)			.35	-	.75(.05)			.44
TES3	-	.97*			.07	-	.87*			.24
TPRS1	-		.62(.00)		.61	-		.65(.08)		.58
TPRS2	-		.87(.04)		.25	-		.87(.06)		.24
TPRS3	-		.82*		.33	-		.81*		.34
CTS1	-			.81*	.35	-			.81*	.34
CTS2	-			.83(.00)	.31	-			.83(.06)	.31
CTS3	-			.70(.00)	.51	-			.72(.06)	.49
Correlations among latent constructs										
PSE	1.00					1.00				
TE	.67	1.00				.73	1.00			
TPR	.90	.60	1.00			.92	.67	1.00		
CT	1.00	.67	.90	1.00		1.00	.73	.92	1.00	

1. All standard errors in parentheses were based on initial unit measure.
2. The covariance matrix for the maximum likelihood estimation was subjected to normalisation whereas the covariance matrix for the weighted least square was not.
3. * Fixed parameter estimation. TES3, TPRS3 and CTS1 were reference variables with a fixed value of 1. TES1 was fixed with a value based on its standard error.

Table 6 Model fit indices for the confirmatory factor analysis of Professional Self-Esteem

Sample size = 471

Fit indices	Maximum likelihood estimation	Weighted least squares estimation
First-order confirmatory factor analysis:		
Chi square	24.78 (df= 19; p=.17)	17.09(df= 19; p=.58)
CFI	1.00	1.00
NNFI	1.00	1.00
RMSEA	.025	.000
PGFI	.42	.42
Standardised RMR	.015	.032
Critical N	687.49	996.42
Total no. of estimated parameters	33	26
No. of iterations	16	10
No. of error covariance	11	5
Second-order confirmatory factor analysis:		
Chi square	29.15(df= 19; p= .064)	17.09(df= 19; p= .58)
CFI	1.00	1.00
NNFI	.99	1.00
RMSEA	.034	.000
PGFI	.42	.42
Standardised RMR	.030	.032
Critical N	584.44	996.42
Total no. of estimated parameters	26	26
No. of iterations	211	33
No. of error covariance	7	5

Table 7 Reliability estimation for indicators based on second-order analysis

Indicators	Maximum likelihood estimation			Weighted least squares estimation		
	Common variance	Specific variance	Estimated reliability	Common variance	Specific variance	Estimated reliability
TES1	.422	.517	.939	.481	.424	.905
TES2	.294	.360	.655	.300	.264	.564
TES3	.422	.517	.939	.403	.355	.758
TPRS1	.311	.073	.384	.358	.060	.418
TPRS2	.613	.144	.757	.640	.106	.746
TPRS3	.545	.128	.673	.555	.092	.647
CTS1	.656	.013	.669	.656	.033	.689
CTS2	.689	.013	.702	.689	.035	.724
CTS3	.490	.010	.500	.518	.026	.544